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# IMF Working Paper

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A Comparative Analysis of  
Government Social Spending Indicators and  
Their Correlation with Social Outcomes in  
Sub-Saharan Africa

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**IMF Working Paper**

African Department

**A Comparative Analysis of Government Social Spending  
Indicators and Their Correlation with Social Outcomes in Sub-Saharan Africa**

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**Abstract**

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This paper analyzes trends in social indicators in sub-Saharan Africa (SSA) and their correlation with the three most widely used scaled measures of government social spending: in per capita terms, as a percentage of GDP, and as a percentage of total government expenditure. On the basis of a regional data set matching health and education outcome indicators with government spending on those sectors, cross-country statistical analysis shows spending both per capita and as a percent of GDP to be of some relevance to social outcomes, but not the share of social spending in budgetary allocations. The policy implications concern not only governments in the region, but also the international donor community for its role in supporting social programs in SSA.

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## SUMMARY

Increasingly, the focus of international development assistance to sub-Saharan Africa (SSA) has turned to improving social conditions in the region. This has led to greater interest in government spending policies and how they affect social priority areas. This paper seeks to contribute to the discussion on the role and effectiveness of social public spending in SSA by analyzing the correlation between alternative measures of public social spending and social indicators in the region and to draw key policy implications.

For analytical purposes, social spending is often proxied by budgetary outlays on health and education, and, for international comparisons, three relative measures of government social spending are most widely used: in U. S. dollar per capita terms, as a percentage of GDP, and as a percentage of total government expenditure. Each of these measures has its informational advantages and shortcomings, but the underlying policy assumption, in terms of any of them, is that the higher the social spending they underscore, the better the social outcome.

The immediate evidence for SSA over the last twenty years suggests such direct relationships between generally improving social indicators in the region and rising social spending levels. To statistically evaluate such relationships, a comprehensive regional data set was put together, on the basis of which sequential cross section regressions for ten social indicators were run against each of the measures of government spending. The results confirmed some correlation between social outcomes and social government spending in U.S. dollars per capita and in percent of GDP, but not in terms of the shares of government spending.

In line with previous research, acknowledging the relevance of underlying social conditions, an attempt is then made to improve regression results by controlling for national situations as proxied by income per capita in U.S. dollars. With the addition of this explanatory variable, the regressions improved significantly for the specifications in terms of U.S. dollars per capita and in percent of GDP that had previously shown to be more significant. The specifications in terms of shares of government spending remained statistically weak.

The key policy implication of these results is that absolute spending allocations are preferable to budgetary shares in terms of enhancing health and education status. This consideration concerns not only SSA governments, but also the international community, given the key role it plays in supporting social programs in the region. Against a background of declining official development assistance in recent years, the results of this paper also reiterate the importance of cost-effectiveness in social program selection.

## I. INTRODUCTION

With the advent of its Poverty Reduction and Growth Facility (PRGF) in 1999, the International Monetary Fund (IMF) has refocused its policy advice for the world's low-income developing countries on more urgently addressing poverty-related economic issues (Köhler, 2000). In doing so, it has added to the trend of increasingly explicit social motivation in international development assistance that emerged in the mid-1990s and led to unprecedented debt forgiveness under the Initiative for the Heavily Indebted Poor Countries (HIPC Initiative) (Camdessus, 1997). Since then, greater priority has been placed by aid providers on visibly and timely improving social conditions in recipient countries, while still emphasizing economic growth as indispensable for raising living standards across all income levels (Hernández-Catá, 2000). The reality of post-independence sub-Saharan Africa (SSA) must have contributed to this new combined approach, since it is the region of the globe where economic growth and social conditions have improved the least despite all the international efforts on its behalf (Srinivasan, 2001).

Against this background, public spending, being the most readily available policy instrument for provision of social services (Tanzi, 1999), has come under increasing scrutiny in SSA countries (Sen, 1992). This has particularly been the case for countries involved in externally supported economic adjustment or sectoral assistance programs underpinned by conditionality that can be geared toward monitoring and enhancing public social policies (Ahmed and Bredenkamp, 2000). With the objective of fostering national policy ownership, another recent concern of international development assistance (Wolfensohn, 2000), the onus has been put on governments in the region to demonstrate that their concern for their most vulnerable citizens is consistent with the humanitarian motivations of aid providers. In terms of public spending, this has meant identifying social priority areas to enable governments to better target and monitor their resources, especially external assistance funds made available explicitly for social purposes. This is currently the case in SSA as regards most bilateral grants, multilateral concessional lending (such as the IMF's PRGF loans or the World Bank's Poverty Reduction Credits), and external debt forgiveness (such as under the HIPC Initiative and, since 1999, its successor, the enhanced HIPC Initiative).

Such heightened concern with enhancing and monitoring social spending can be seen as the policy-design recognition that in SSA public spending had been ineffective in improving social equity and long-run economic growth (Fischer, Hernández-Catá, and Khan, 1998). It also represents a more hands-on approach to external assistance that underscores a response to increasing awareness of governance issues (Klitgaard, 1996) in terms of the social opportunity costs of inequitable or unproductive public spending (Ayittey, 1992). Which is precisely why, to improve implementation prospects, the new emphasis on social conditionality under external assistance programs (Gupta and others, 2000) is being supplemented with stronger expectations of policy ownership on the part of national authorities, so that, ultimately, both aid givers and receivers may deliver on jointly endorsed social improvement goals (Khan and Sharma, 2001).

This paper seeks to contribute to the discussion on the role and effectiveness of public social spending in SSA by analyzing linkages between alternative measures of such spending

and social indicators in the region and to draw some policy implications. For that purpose, a consistent and comprehensive regional data set was put together for sequential econometric testing, using a series of social indicators and alternative measures of government spending. On the basis of the evidence from those tests, conclusions are drawn on the relative relevance of such measures for policymaking purposes.

## II. RELATIVE MEASURES OF PUBLIC SOCIAL EXPENDITURE

In ascertaining linkages between public social expenditure and social indicators in SSA, two questions must first be addressed: (i) Which public spending should be counted as “social”? and (ii) how should such spending be compared across countries?

The answer to the first question is usually based on a functional classification of government expenditure, according to which “social” is understood to be spending on “the public provision of health, education, housing, and other social services” (Chu and Hemming, 1991). In practical terms, this usually means that social spending can be proxied by total spending under relevant government agencies, such as for example a ministry of education (for education spending), a ministry of health (for health), government welfare agencies (for income support), and so forth, if other plausible ministries or agencies can be identified (UNDESA, 2000). This is a general simplifying approach that allows the generation of working estimates, such as those in the IMF (IMF, 2001b) and World Bank (World Bank, 2001) health and education spending databases referenced in this paper. But it does not necessarily validate the social merit of such ministries and agencies’ expenditures, and it may exclude lifeline social expenditures by the other ministries and agencies. For example, costly medical and educational expenses abroad for the well-connected may be counted as “social expenditure,” while meager civil service wages (in “nonsocial” ministries) providing for the basic needs of entire families may not.

The second question, on comparing social spending across countries, is even more complex and is the subject of much of the analysis in this paper. The comparison problems start with the existence of different national budgetary reporting standards. Then, there is the problem of reliability of fiscal data, which, in SSA countries in particular, may omit or misreport government spending (social and other) due to a lack of accounting or accountability (Ramakrishnan, 1998). In addition, there are the usual intercountry comparison biases related to exchange rates, purchasing power parity, and all sorts of national particularities that cloud the relativity of any given measure of social spending. For example, disease prevention allocations may well be larger in a country with endemic occurrences, but this does not mean that they can be deemed more or less adequate than in another country where allocations are smaller, but so are disease prevalence rates or infection-prone conditions. The same sort of inconclusiveness could arise from comparing education spending in a country with an urban concentration of population versus another with rurally dispersed demographics that prevent economies of scale in the provision of schooling services.

In any event, some form of standardization is necessary for cross-country comparisons. To this effect, three measures of public social spending are commonly employed in international surveys: (i) social spending per capita, measured in a major international currency (usually the

U.S. dollar), (ii) social spending in percent of a measure of national income (usually GDP), and (iii) social spending in percent of total government expenditure. Each of these measures has its advantages and handicaps in terms of gauging the adequacy of social spending. Per capita spending levels help with absolute level international comparisons; percentages of GDP are useful in establishing economic relativity; and shares of government spending, being a more discretionary indicator, give some sense of policy direction and potential.

As will be discussed next, each of these measures provides different levels of insight into SSA's social indicators.

### III. RECENT TRENDS IN SOCIAL SPENDING AND SOCIAL INDICATORS

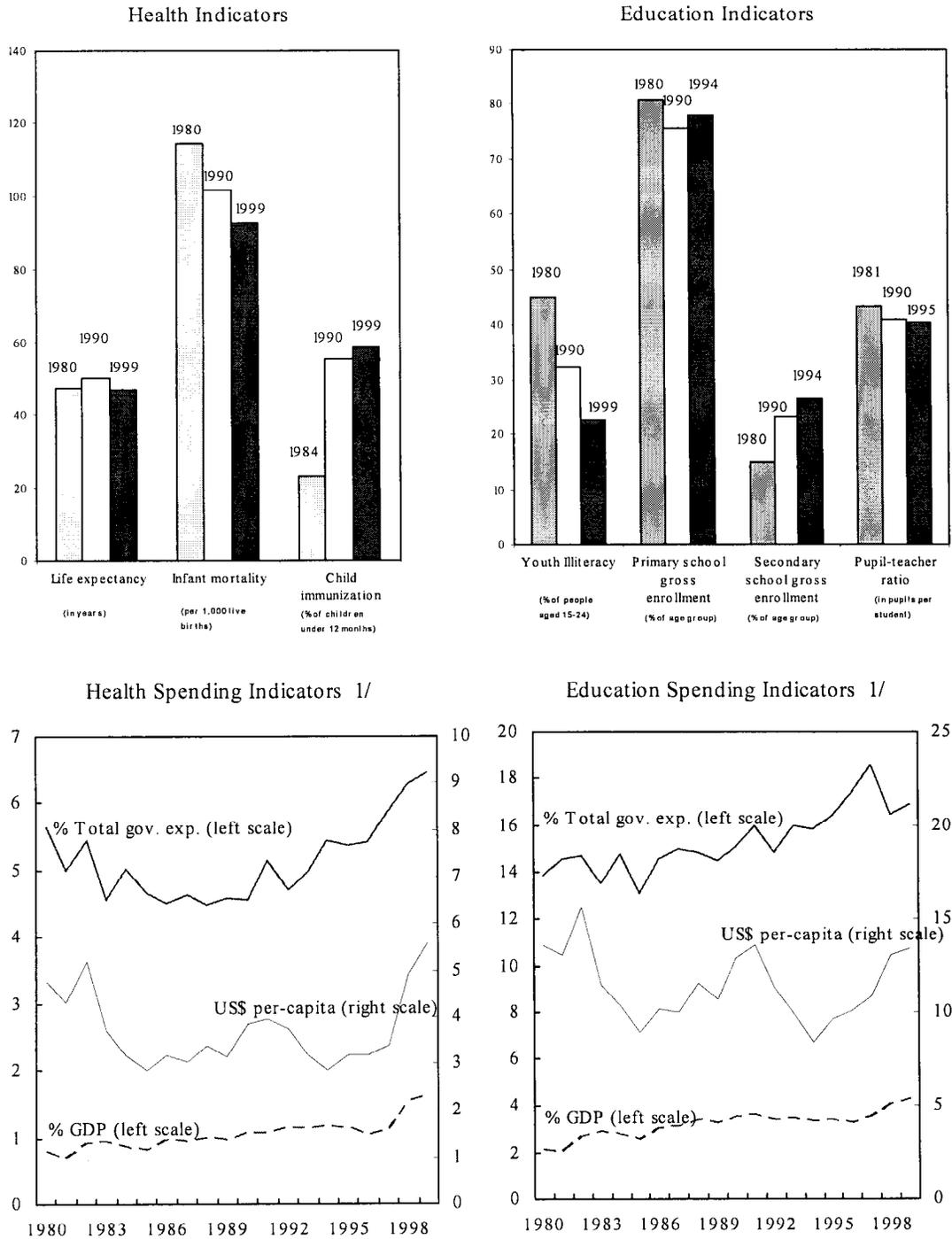
A survey of time trends in key health and education indicators in SSA, as compiled in the World Bank's *World Development Indicators* (2001), over the last twenty years points to general improvements in the region (Figure 1, top panels). For some indicators such improvements have been marked (child mortality, immunization, literacy); for others rather marginal (life expectancy, school enrollment rates). Across individual countries the trends are less well-defined, with some countries recording setbacks in social indicators in recent years—specially those countries that have experienced armed conflicts or high prevalence of HIV/AIDS (Moser and Ichida, 2001). But while the generally improving trends are a corollary to the increasing access to social services in SSA over the past 20 years, it is not evident that such access can be primarily attributed to more generous social spending policies by governments in the region.

For that to be the case, one would expect to see a parallel rising trend in social spending over time. However, the evidence is not as clearcut (Figure 1, bottom panels).<sup>2</sup> The time trends in social spending indicators also rise over time, but with considerable volatility and not for all spending measures. While spending indicators for both health and education relative to GDP and total budgetary expenditure show visible rising trends over time, the series in terms of U. S. dollars per capita swings considerably over the period of analysis and may well have been on a downward trend during the 1990s until it spiked upward at the end of the decade. Such swings in per capita spending reflect to some extent exchange rate volatility, as lower levels of spending appear to coincide with an appreciating U.S. dollar (in particular, in CFA franc countries after the devaluation). They may also be associated with waning levels of foreign assistance in recent years, as discussed below.

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<sup>2</sup> While the averages for the sub-Saharan social indicators were extracted from a single, published source (World Bank, 2001), for the spending indicators they were calculated using a 49-country compiled for this study from the IMF's Government Finance Statistics (IMF, 2001a) and World Economic Outlook (IMF, 2001b) country-desk databases. As a result, country and time discontinuities in data availability had to be taken into account by adjusting the calculation of the regional averages, which thus do not include the same number of countries for every year. Moreover, given its large regional weight, South Africa was excluded from the averages, because its markedly higher but unevenly distributed level of social spending would distort the picture of the spending situation for the typical SSA country. Two other small countries (Mauritius and Seychelles) with even higher social spending indicators were accordingly also excluded.

Figure 1. Health and Education in Sub-Saharan Africa:  
Indicators and Government Spending, 1980–99



Sources: World Bank, *World Development Indicators, 2001*; and International Monetary Fund, *Government Finance Statistics, 2001* and *World Economic Outlook, 2001* country databasis.

1/ Excluding Mauritius, Republic of South Africa, and Seychelles, where considerably higher levels of social spending distort typical trends for Sub-Saharan African countries.

In addition, it is worth noting that all the indicators of social spending rose sharply at the very end of the survey period, suggesting that the heightened expectations with respect to social spending since the advent of the HIPC/PRGF may have led to greater budgetary allocations to the social sectors in aid-recipient SSA countries (IMF, 2002). In the same vein, and as suggested by the higher frequency of reporting in the latter years of the data sets, it is also possible that improvements in tracking and reporting social expenditure may have contributed to more complete and rising statistics.

#### **IV. COMPARING CORRELATIONS BETWEEN SOCIAL SPENDING MEASURES AND SOCIAL OUTCOMES**

The most straightforward way of ascertaining the occurrence and nature of linkages between measures of public social spending and actual social indicators for multiple countries is to test statistical correlations using cross-section data. The underlying hypothesis is that countries with higher levels of social spending will exhibit better social indicators. This hypothesis is intuitively supported by the reality in industrialized countries, although, as shown in previous research, it does not come across strongly from evidence for developing countries. As explored in this section, such a lack of explanatory strength was also observed in SSA-specific cross-section econometric regressions, which, nonetheless, were conclusive enough to gauge the relative explanatory power of each of the three previously mentioned measures of social spending.

##### **A. The Data Set**

A major hurdle to analytical work on social policy in SSA is the scarcity of meaningful and consistent data on social outcomes and policy variables. With this caveat in mind, a pragmatic effort was made in this paper to build a data set gathering as much data as possible for 48 SSA countries for the period 1980–99. This was accomplished by using published statistics on social indicators extracted from the World Bank’s World Development Indicators (WDI) database, and, where available, on government spending on health and education from the IMF’s Government Finance Statistics (GFS) database. However, the latter source did not provide sufficient statistics for all countries, all variables, and all years to generate representative results for the SSA region. To overcome this problem, the GFS series were supplemented with information on government spending on health and education from the IMF’s World Economic Outlook (WEO) cross country database, which is put together from periodic submissions by staff assigned to the respective countries. Although no alternative source of information was similarly available for missing social indicator statistics, it was possible in this manner to fill in information gaps for 18 SSA countries, so that at least some social spending information was included for all but 12 of the 48 countries (although not for all years, nor for all measures of spending). The actual number of cross-country observations usable for econometric tests varied depending also on data availability for social indicators, 10 of which were selected precisely on the basis of frequency of data availability. For example, while for life expectancy, testable information was available for 33 countries, for patients per physician it was available only for 13 countries. Also, because the frequency of publication of several of the

social indicators was not annual, the years selected for testing data were those as recent and with as many observations as possible for the social indicator dependent variable.

Another data set complication arose with the presence of five SSA countries (Botswana, Mauritius, Namibia, Seychelles, and South Africa) with absolute (U.S. dollar) levels of government per capita spending substantially above those for the typical SSA country. This caused the respective observations to behave as extreme “outliers” and bias the regression results, and, to prevent that, the five countries were dropped from the regressions where the explanatory variable was U.S. dollar per capita spending. They were kept in the other regression specifications whereby social spending was scaled to GDP or total government expenditure.

While such data compromises made for a less-than-ideal data set in terms of cross-country coverage and series consistency, they still allowed for the compilation of, to the best of our knowledge, as comprehensive a basis for analyzing social spending in SSA as has been put together. It also sufficed to produce, as intended, elucidative results on the relative merits of the alternative measures of social spending.

## **B. The Econometric Results**

To ascertain the relative explanatory power of the three alternative measures of government social spending with some degree of sample conclusiveness, they were each tested against an expanded group of ten social indicators (five health related and five education related). Thus, each of the social indicators was sequentially paired against each of the measures of relevant health or education spending, so as to ascertain their correlation (measured by the *adjusted R-square* ratio for the regression) and the statistical significance of the dependent variable (measured by the *t-ratio* of the regression coefficient). To better gauge the raw explanatory power of each of those measures, no statistical refinement methods were attempted, such as logarithmic transformations (which showed in side tests to produce better regression statistics for several of the specifications), the introduction of dummy variables, or the reformulation of explanatory variables to more closely match the scale of the independent variables.

Table 1 summarizes the key results for the 30 regressions that jointly provide some insight into the relative explanatory strength of each of the three spending measures. To better grasp the main results by visualizing them, plots of the two most commonly monitored of each of the education and health social indicators are shown in Figures 2-5, along with additional regression statistics. The results in Table 1 and in Figures 2-5 point to three major conclusions:

First, with perhaps the exception of female secondary enrollment, none of the indicators of social spending is by itself very powerful in explaining social outcomes in this data set. In some cases (hospital beds, physicians per thousand people, and pupil-teacher ratios), there is virtually no correlation. Such generally weak relationships are consistent with earlier findings and modeling attempts that resort to supplementing spending indicators with other policy and context variables (see Gupta, Verhoeven and Tiongson, 1999, for a review of previous empirical results and a critical analysis).

Table 1. Sub-Saharan Africa: Summary Table of Relative Explanatory Power of the Three Categories of Government Spending Indicators

(Available cross-section data for year indicated) 1/

	Relevant Spending Indicator					
	US\$ PC		Percent of GDP		Percent of total government expenditure	
	Adj. R <sup>2</sup>	Sign of regressor as expected/significant at 10 percent	Adj. R <sup>2</sup>	Sign of regressor as expected/significant at 10 percent	Adj. R <sup>2</sup>	Sign of regressor as expected/significant at 10 percent
(Values indicate adjusted R <sup>2</sup> from single explanatory variable linear regressions; in bold indicates best result among spending indicators)						
Health indicators						
Infant mortality rate (1997)	<b>0.232</b>	yes/yes	0.116	yes/yes	-0.022	yes/no
Life expectancy at birth (1997)	<b>0.340</b>	yes/yes	0.139	yes/yes	-0.015	yes/no
Low birth weight (1988)	<b>0.088</b>	yes/no	-0.052	yes/no	-0.051	yes/no
Physicians per 1,000 people (1990)	<b>0.030</b>	yes/no	-0.011	yes/no	0.002	no/no
Hospital beds (1990)	-0.071	no/no	<b>-0.058</b>	yes/no	-0.062	yes/no
Education indicators						
Gross enrollment rate (1997)	0.257	yes/yes	<b>0.260</b>	yes/yes	0.058	yes/no
Youth illiteracy rate (1997)	<b>0.126</b>	yes/yes	0.088	yes/yes	-0.024	no/no
Adult illiteracy rate (1997)	<b>0.150</b>	yes/yes	0.116	yes/yes	-0.028	yes/no
Pupil-teacher ratio (1995)	<b>0.086</b>	yes/yes	-0.016	yes/no	-0.010	yes/no
Female secondary enrollment (1993)	0.308	yes/yes	<b>0.446</b>	yes/yes	0.092	yes/yes
Frequency of highest explanatory power/ sign as expected and significant	7	7	3	7	0	1

Source: Econometric tests using World Bank and International Monetary Fund data as described in the text.

1/ The number and list of countries used in the regressions varies for each dependent variable, according to data availability for that variable; in addition, for the regressions against U.S. dollar per capita spending indicators, a group of five relatively high-income countries (Botswana, Mauritius, Namibia, Seychelles, and South Africa) was excluded as outliers far in excess of typical SSA levels.

Second, spending indicators appear to be relatively better at explaining education outcomes than health outcomes. This is consistent with Gupta, Verhoeven and Tiongson (1999) own findings, which was the only reference found where education and health spending are also comparatively tested from consistent data sets. This is also in line with the intuitive reckoning that in SSA it may be more costly and complex to set up and operate medical care facilities than schools, given the relative infrastructure, professional, and supply requirements.

Third, whether or not the results show full consistency, correlations are stronger when either social spending as a percent of GDP or social spending in U.S. dollars per capita is used. Social spending in percent of government expenditure shows negligible correlations, as in all but three instances the *adjusted R-square* ratios are negative and in all but one the regressors are not statistically significant at the 10 percent level. Such weak results are consistent with the established preferential usage of indicators of per capita spending and shares of GDP for policy analysis purposes, as noted by Gupta, Verhoeven and Tiongson (1999), who nevertheless concluded “that the expenditure allocations within social sectors matter for education and health status.”

Their conclusion was quantitatively drawn on the basis of econometric formulations that included as many as six control variables to render significant the explanatory power of expenditure allocation shares. In the next section, a similar but more simplified attempt is made to confirm the relative results presented in Table 1 by introducing a single control variable to proxy differences in country socioeconomic contexts.

## V. SOCIAL WELFARE, SOCIAL SPENDING, AND INCOME LEVEL

It stands to reason that sharp improvements in social indicators cannot be achieved overnight by simply increasing targeted government spending. In fact, other than infant-related indicators, it may take longer than a generation to significantly impact indicators that cover whole populations containing individuals too old or too handicapped to change their health or education situations. Therefore, prevailing socioeconomic levels will condition social indicators in subsequent periods independently of how much social spending is changed. In terms of analytical modeling, this means that such country-specific socioeconomic levels, including other social indicators, can be considered as explanatory variables as well.

While we are not seeking here to develop a high-explanatory power model of social outcomes, but rather to compare the raw statistical relevance of each measure of social spending, the previous results can be consolidated by adding an adequate proxy for the missing socioeconomic context variables. Specifically, we propose to introduce in the regressions a representative measure of income that has been shown to bear statistically significant relationships to health and education outcomes (Tresserras and others, 1992): GDP per capita in U.S. dollars. This choice is based on the straightforward income relevance of GDP per capita for crosscountry comparisons and its data availability for all SSA countries. Other nonincome structural variables have also been shown to be relevant as regressors for the SSA context, namely, demographic factors, urbanization status, and conflict dummies (Gupta, Verhoeven, and Tiongson, 1999), as well as other social indicators (Baldacci, Guin-Siu, and de Mello,

2002). However, their inclusion more often than not all but suppresses the explanatory significance of the relevant measure of social spending. To avoid this, and to keep the analytical focus on the three alternative measures of social spending, only GDP per capita is being added as a control variable to the regressions.

The implicit modeling formulation is to treat social indicators ( $S_{i,j}$ ) as a function of a relevant measure of government social spending ( $G_{i,k}$ ) and of country-specific structural conditions ( $C_{i,l}$ ), or more formally as the following:

$$S_{i,j} = f(G_{i,k}; C_{i,l}); \quad \text{where } i, j, k, \text{ and } l \text{ are, respectively, vectors of countries, social indicators, alternative government spending measures, and per capita income levels.}$$

The results from the introduction of the per capita income regressors are summarized in Table 2. Overall, the coefficients of determination (*adjusted R-square* ratios) improved for the regression specifications that had already shown the best results in the single-variable tests. For the other specifications, the statistical results continued to be weak, if not penalized by the inclusion of the additional variable. In terms of the alternative spending measures, the U.S. dollar per capita and percent of GDP regressions continued to show the stronger results. Although the *adjusted R-squares* for the regressions using shares of total government expenditure improved markedly, this was apparently on account of the income regressors; the spending regressors' coefficients remained statistically insignificant or exhibited the wrong sign in all but one instance. Predictably, the results for the U.S. dollar per capita specifications suffered from collinearity between the dependent variables, which was perhaps why the regressions in percent of GDP improved the most.

## VI. CONCLUSIONS AND POLICY IMPLICATIONS

This paper set out to look into the relative usefulness of different definitions of social spending in explaining social outcomes in SSA countries. The findings, based on the three most utilized measures of social spending, were consistent with previous research showing weak direct linkages in terms of most social indicators. The comparisons also confirmed the established strength of the per capita spending and share of GDP indicators relative to budgetary allocations, which have recently gained visibility in terms of policy design and monitoring.

The econometric and survey results presented here suggest, as a key policy implication, that absolute levels of social spending matter the most for social outcomes and that budgetary allocations may be misleading. If so, an improvement in the latter would only be meaningful to the extent that it brought about an improvement in the former. Such coincidence can be expected in a stable context of year-to-year rising real government spending, but that is not always the case in SSA, where budgets may be affected from one year to the next by exogenous swings (in commodity prices or external assistance, for example). Thus, policymakers should not view rising shares of government spending as a sufficient condition to deem social allocations more adequate, let alone to claim that more resources are being channeled to priority social sectors.

Table 2. Sub-Saharan Africa: Summary Table of Relative Explanatory Power of the Three Categories of Government Spending Indicators In Conjunction with an Income Control Variable

(Available cross section data for year indicated) 1/

	Relevant Spending Indicator											
	US\$ per capita				Percent of GDP				Percent of total gov. expenditure			
	Adj.	Regressors			Adj.	Regressors			Adj.	Regressors		
	R <sup>2</sup>	Signs	Signif. at 10 % level		R <sup>2</sup>	Signs	Signif. at 10 % level		R <sup>2</sup>	Signs	Signif. at 10 % level	
	identical and as expected	Spending indicator	GDP per cap		identical and as expected	Spending indicator	GDP per cap		identical and as expected	Spending indicator	GDP per cap	
(Values indicate adjusted R <sup>2</sup> from two explanatory variable linear regressions; in bold indicates best result among spending indicators)												
Health Indicators												
Infant mortality rate (1997)	0.231	yes	yes	no	<b>0.402</b>	yes	yes	yes	0.345	yes	yes	yes
Life expectancy at birth (1997)	<b>0.362</b>	yes	yes	no	0.361	yes	yes	yes	0.284	yes	no	yes
Low birthweight (1988)	-0.100	no	no	wrong sign	-0.002	yes	no	no	<b>0.011</b>	no	wrong sign	no
Physicians per 1,000 people (1990)	-0.019	no	no	wrong sign	-0.104	yes	no	no	-0.089	no	wrong sign	no
Hospital beds (1990)	<b>0.032</b>	no	no	wrong sign	-0.131	yes	no	no	-0.133	yes	no	no
Education Indicators												
Gross enrollment rate (1997)	0.321	yes	no	no	<b>0.365</b>	yes	yes	yes	0.265	yes	no	yes
Youth illiteracy rate (1997)	0.118	yes	no	no	<b>0.163</b>	yes	no	yes	0.143	no	wrong sign	yes
Adult illiteracy rate (1997)	<b>0.1429</b>	yes	yes	no	0.126	yes	no	no	0.069	no	wrong sign	no
Pupil-teacher ratio (1995)	-0.112	yes	no	no	0.034	no	wrong sign	no	<b>0.034</b>	yes	no	no
Female secondary enrollment (1993)	0.2883	no	yes	wrong sign	<b>0.682</b>	yes	yes	yes	0.629	no	wrong sign	yes
Frequency of highest explanatory power/ signs identical and significant	3	6	4	0	4	9	4	5	2	5	1	5

Source: Econometric tests using World Bank and International Monetary Fund data as described in the text.

1/ The number and list of countries used in the regressions varies for each dependent variable, according to data availability for that variable; in addition, a group of five relatively high income countries (Botswana, Mauritius, Namibia, Seychelles, and South Africa) was excluded as outliers with per capita incomes far in excess of typical SSA levels.

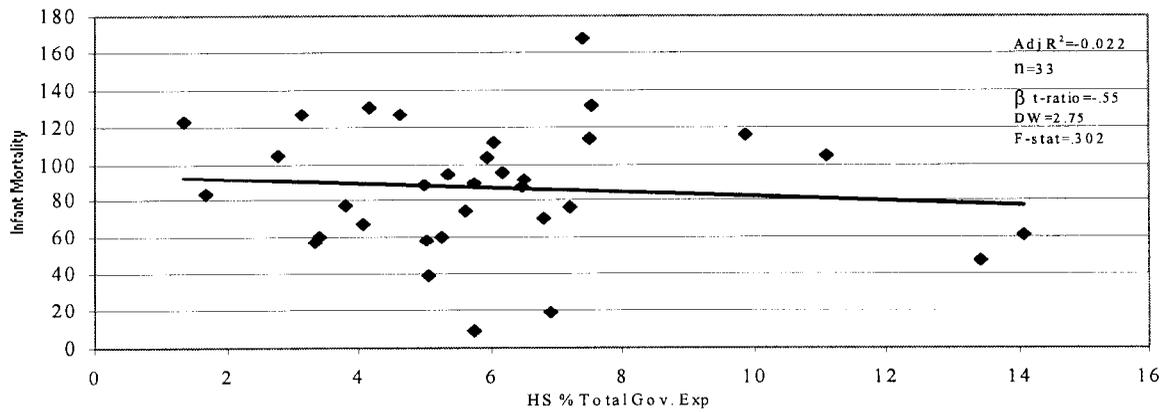
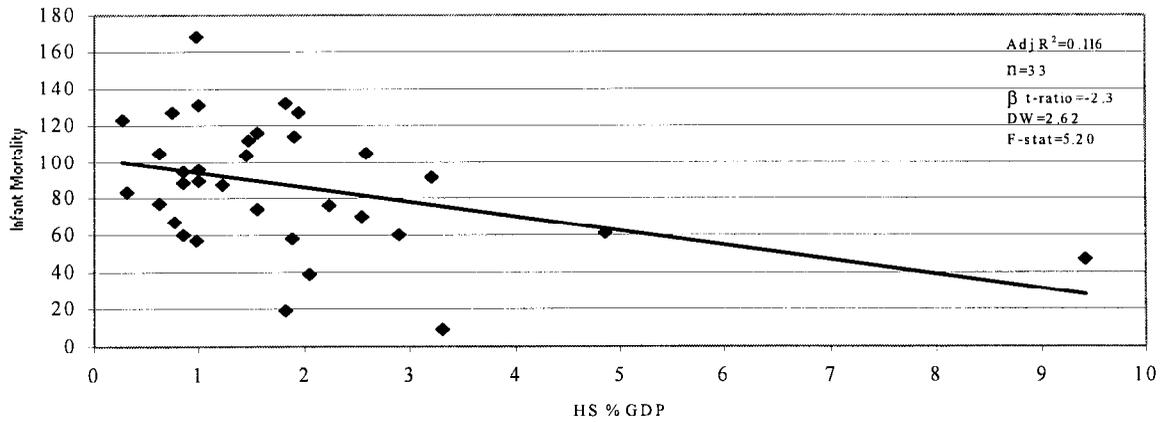
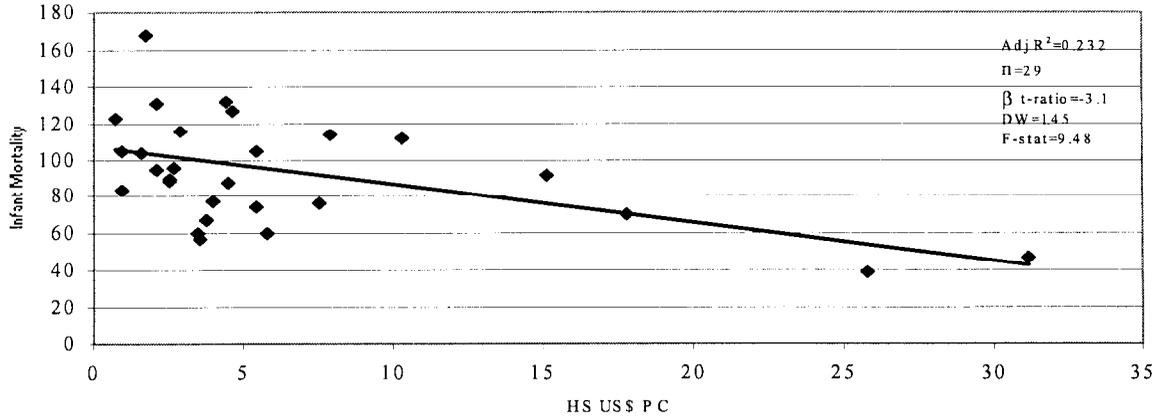
The recognition that absolute social spending allocations are paramount in determining social outcomes also has major implications for international assistance policy to SSA. It is a regionally established reality that many public social spending programs are directly financed by bilateral donors or multilateral agencies. However, since the early 1990s, per capita external assistance to SSA countries has been on a declining path, in line with global reductions in aid (Ahmed and Bradenkamp, 2000). According to *World Development Indicators* (2001) figures, total net official development agency (ODA) assistance fell, on a per capita basis, from US\$36 in 1990 to US\$20 in 1999. Although spending levels in SSA have not fallen accordingly (Figure 1), such reductions may have taken a toll, or may do so with a lag, on potential improvements in regional social indicators. Against this background, full consideration of alternative measures of social spending in terms of their potential implications on local social indicators would seem highly relevant for donors in deciding nominal assistance levels and their regional distribution.

Evaluating prospective benefits by reference to multiple relative measures of social spending should also be of great usefulness for national decisionmakers. The fact that resources for social programs are scarce and may be declining underscores the need to strive for cost-effectiveness in selecting and implementing such programs. For example, if, as the econometric results suggest, education indicators respond better to higher government spending, then visible results from additional spending may be easier and more quickly achieved for education programs than for health programs. More generally, decisions on social spending targets can be enhanced if those targets are defined in terms of social spending indicators with higher correlation to the desired outcomes.

In the same vein, additional insight on spending allocations may also help when deciding between competing social programs on the basis of implementation constraints. Such insight can be gained from actual evidence of relatively poor social outcomes (in terms of social spending levels) and establishment of the underlying impediments. For example, if implementation capacity or commitment has proven to be a concern in a specific social area, then decision makers may well opt for another area instead. At the international level, this implies taking into account the relative social policy implementation records of aid-recipient countries and, in delivering assistance, carefully choosing between local partners (national governments, nongovernment organizations, or other local channels) according to their comparative reliability.

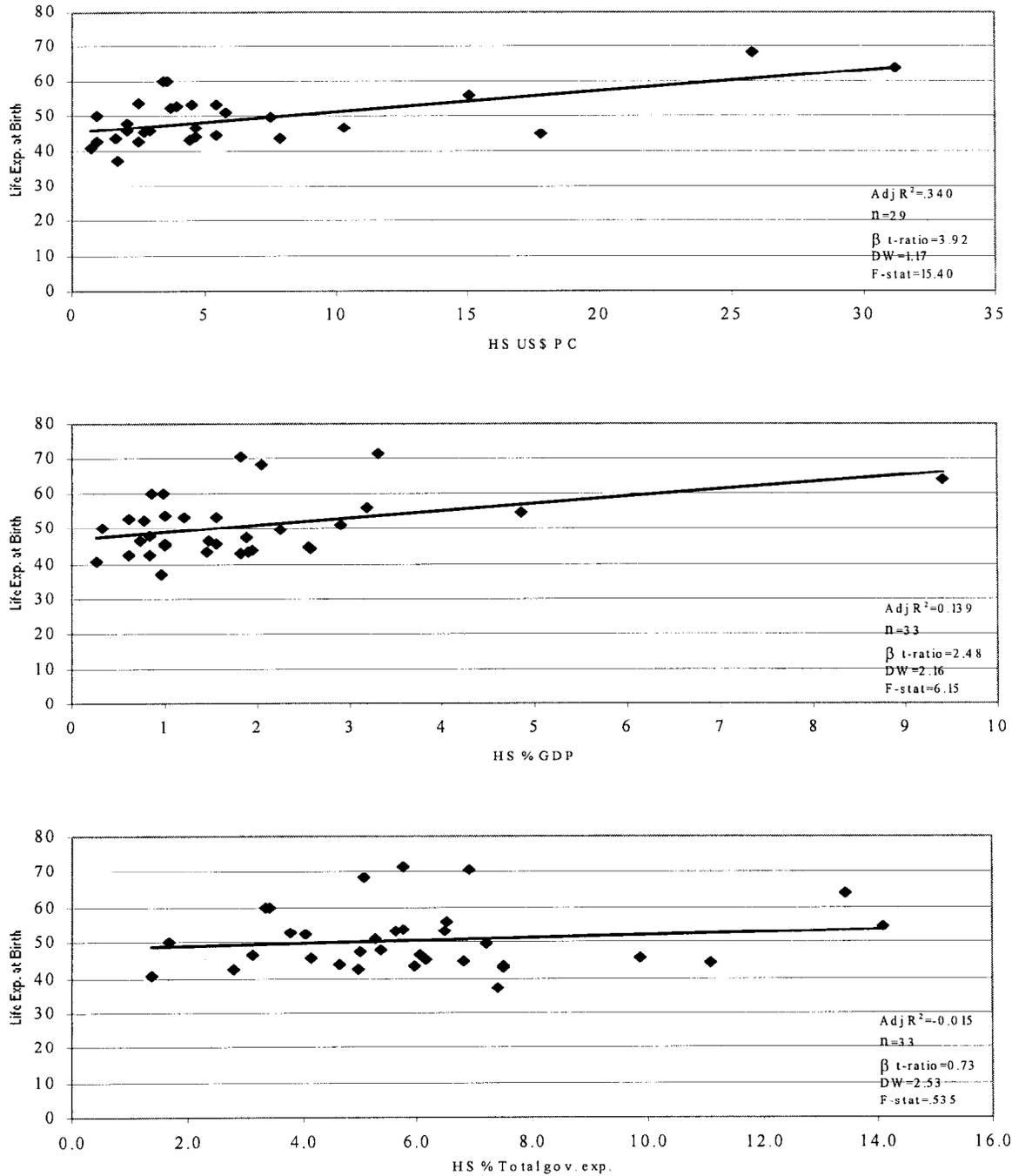
To conclude, consideration of alternative measures of social government spending enables a better understanding of social indicator levels and of how much they may respond to changes in spending. For SSA, any such understanding can only help in making the right life-and-death decisions needed to overcome the harsh social realities in the region.

Figure 2. Sub-Saharan Africa: Public Health Spending and Infant Mortality, 1997



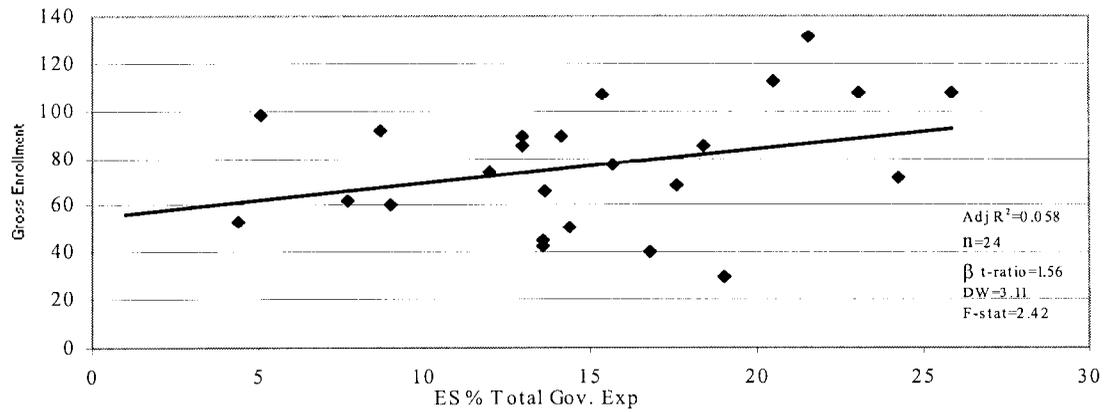
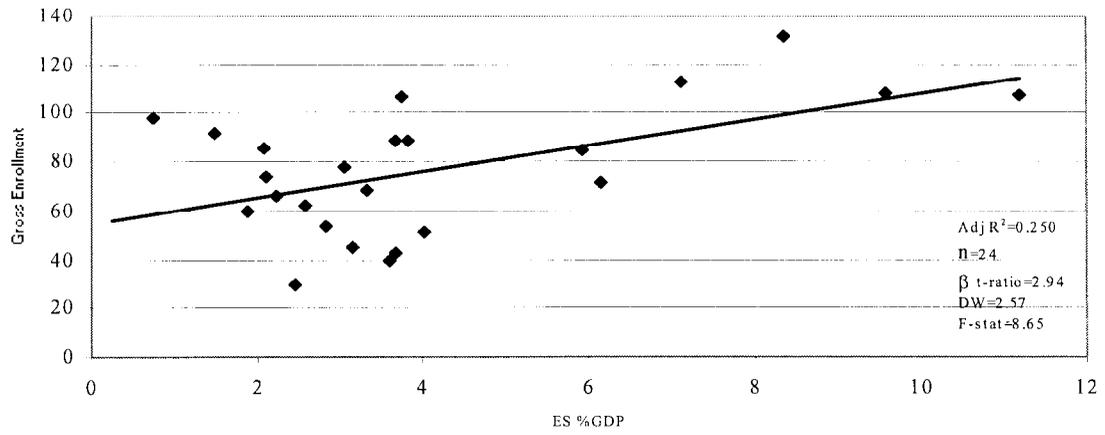
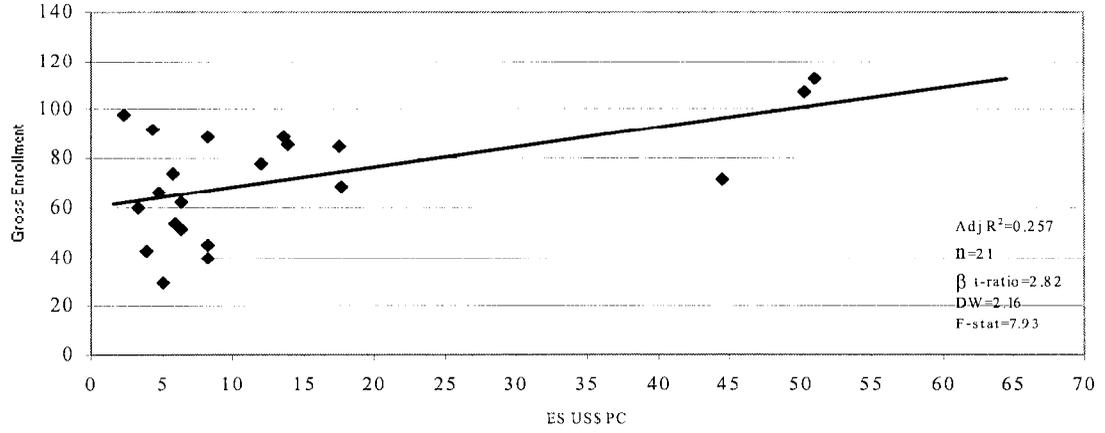
Sources: World Bank, *World Development Indicators, 2001*; and International Monetary Fund, *Government Finance Statistics, 2001* and *World Economic Outlook, 2001* country databasis.

Figure 3. Sub-Saharan Africa: Public Health Spending and Life Expectancy at Birth, 1997



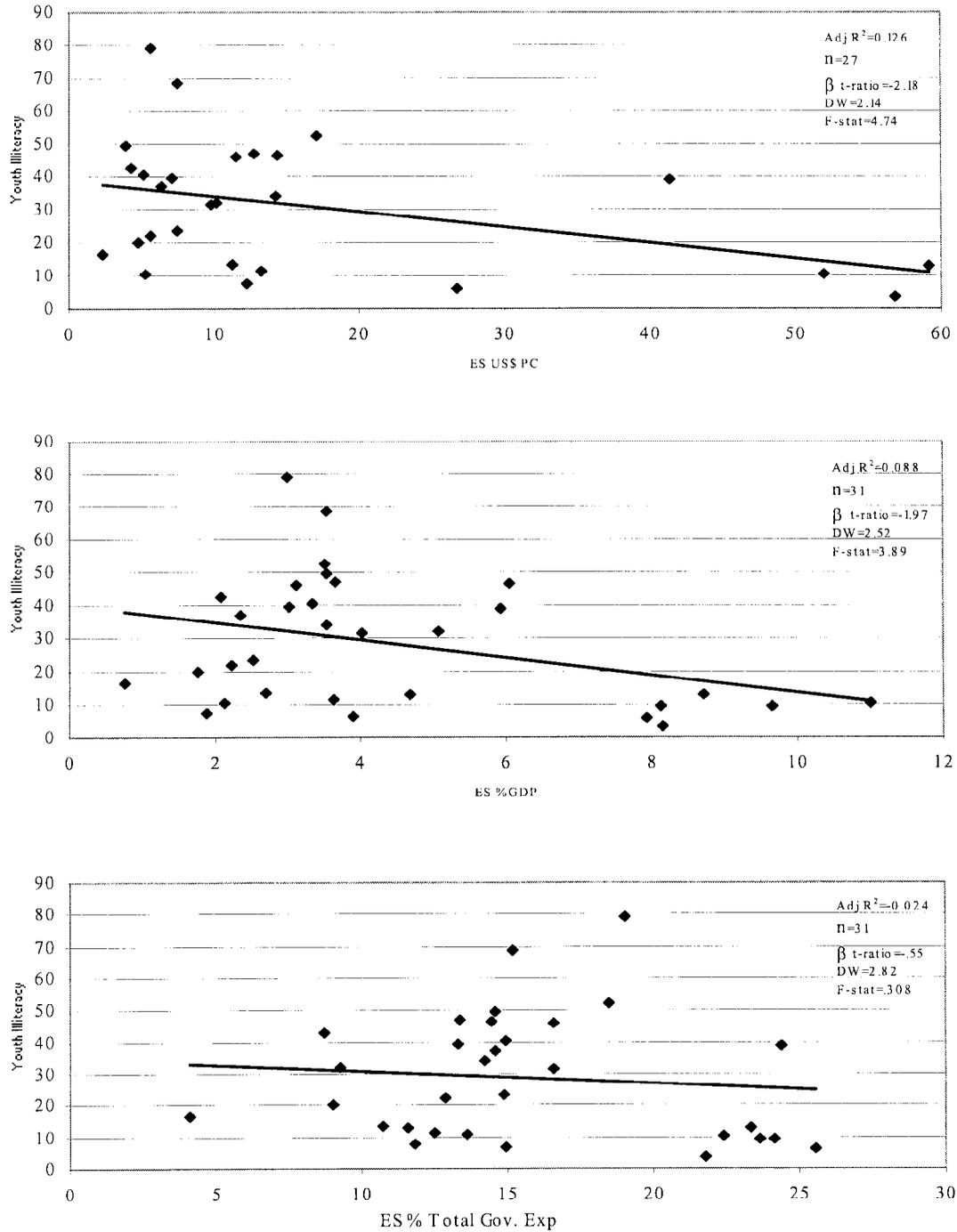
Sources: World Bank, *World Development Indicators, 2001*; and International Monetary Fund, *Government Finance Statistics, 2001* and *World Economic Outlook, 2001* country database.

Figure 4. Sub-Saharan Africa: Public Education Spending and Gross Enrollment, 1996



Source: World Bank, World Development Indicators, 2001; and International Monetary Fund, Government Finance Statistics, 2001 and World Economic Outlook, 2001 country databases.

Figure 5. Sub-Saharan Africa: Public Education Spending and Youth Illiteracy Rate, 1999



Source: World Bank, World Development Indicators, 2001; and International Monetary Fund, Government Finance Statistics, 2001 and World Economic Outlook, 2001 country databases.

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